PROCEEDINGS OF THE BIOLOGICAL SOCIETY OF WASHINGTON
109(4):664–676. 1996

Sericosura heteroscela and *S. cyrtoma,* new species, and other Pycnogonida from Atlantic and Pacific hydrothermal vents, with notes on habitat and environment

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Abstract.—The first new hydrothermal vent pycnogonid from the Mid-Atlantic Ridge, *Sericosura heteroscela,* new species, is described and illustrated from specimens taken in 1727 m south of the Azores and other nearby localities in similar depths from vent areas just west of the Azores. Males of this new species have extremely dimorphic anterior and posterior propodi. Another new species, *S. cyrtoma,* is described and figured from a hydrothermal vent at 13°N off the Pacific coast of Mexico, in 2563 m. A juvenile specimen of a possibly new third *Sericosura* species is discussed and compared with *S. venticola* Child. The specimen was taken from vents north of Easter Island, southeast Pacific, in 2578 m. The three species are compared with each other and with other known hydrothermal vent species in this genus, their distribution is discussed, and a *Sericosura* key is presented. Two known species in the genera *Callipallene* and *Colossendeis* are also listed from the same Mid-Atlantic vent areas. Descriptive remarks on the habitat and environment of the specimens are presented.

Sericosura species have been associated with the majority of pycnogonid captures from hydrothermal vent exposures. Most of them (70+%) are from recently discovered tectonic spreading zones of the north and south Pacific (Child 1987, 1989; Stock 1991) and more recently in Atlantic localities (Segonzac 1992). The type species of this genus, *Sericosura mitrata* (Gordon 1944:54–57, figs. 19a–e, 22b), was described before hydrothermal vents were known. It was collected from an Antarctic locality where no hydrothermal vent is known (219 m). It is now considered, if correct (Gordon questioned the validity of her data), as being too shallow to be a vent exposure, when compared with other *Sericosura* species collected from vent fields. This species was later collected in depths more consistent with known hydrothermal vents, in 2100 m on the Walvis Ridge off South Africa (Child 1982a:19–21, fig. 6). Whether or not the Walvis Ridge specimen was associated with hydrothermal vents was not recorded and remains unknown, although the Walvis Ridge is not known to have hydrothermal vents. A specimen of this species was also found and reported (Segonzac 1992:596) from the Snake Pit area at 23°N on the Mid-Atlantic Ridge.

Two other hydrothermal vent species have been described more recently as additional vents were discovered and their fauna examined. *Sericosura venticola* Child (1987:896–899, fig. 2), was collected from hydrothermal vent fields on the Juan de Fuca Ridge and other hydrothermal vent areas in the northeast Pacific, in 2200 m. *Sericosura cochleifovea* Child (1989:732–737, fig. 1), was collected from vent fields in the

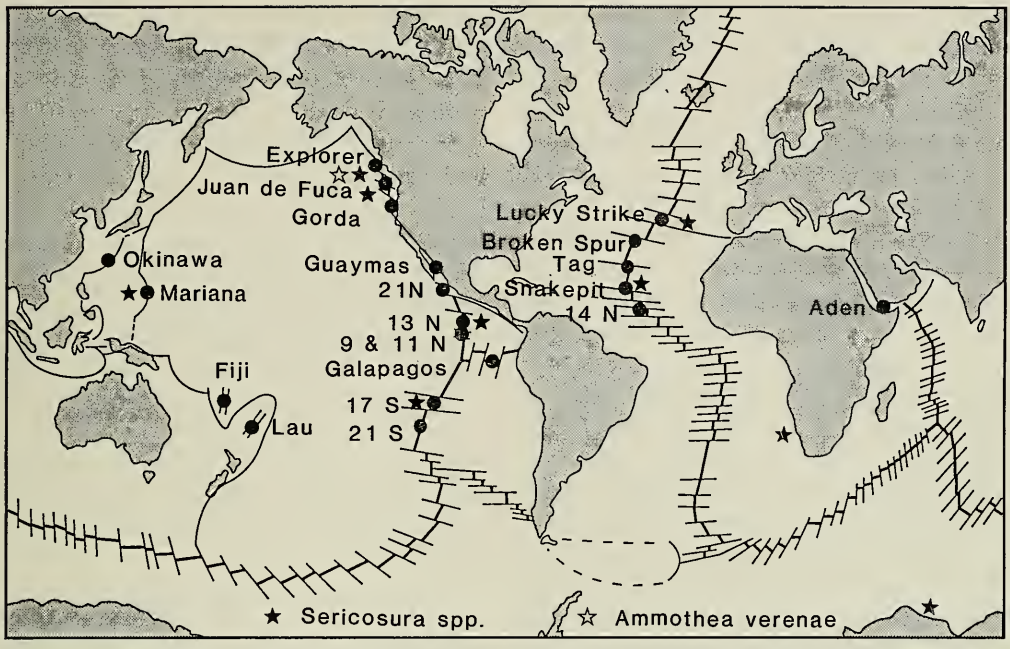

Fig. 1. Distribution of hydrothermal vent (black circles) with associated pycnogonids (except Walvis Ridge and Antarctic records) with locations for *Sericosura* (black stars) and *Ammothea* vent-associated species (white star).

Back-Arc Basin of the Mariana Islands in 3600 m. Stock (1991:158–160, figs. 24, 25) described *Sericosura bifurcata* from the New Caledonia basin, SW Pacific, in 3680–3700 m. *Sericosura bifurcata* could have been associated with hydrothermal vents, particularly at those collecting depths, although no vents are known in this area. I believe that Stock's proposed species is probably *S. cochleifovea* with variations rather than a separate species.

With the increasing efforts of many nations to discover and explore hydrothermal vent localities, it is not difficult to predict that more new species and additional localities for known species will be described in the near future.

Figure 1 shows the known distribution of the genus *Sericosura* (solid stars) and of *Ammothea verenae* Child (open star), the only hydrothermal *Ammothea* species known. The species concerned are predominantly but not exclusively found in areas of active hydrothermal vents. *Sericosura* has a cosmopolitan distribution and is a deep-water genus although it is not confined to abyssal depths. However, the distribution of these species is poorly known because of the small number of collections. Three species out of five are only known from their type locality, excluding the two new species presented herein. It is significant that in the distribution of *Sericosura* species, *S. mitrata* the first known species, has been collected from such diverse and widespread areas as the Walvis Ridge (Child 1982a), the Snake Pit hydrothermal area of the North Atlantic, and from the Antarctic (Gordon 1944). From this evidence, the distribution of this species possibly extends to sites along the Mid-Atlantic Ridge and it will be found at other Atlantic sites. It will be interesting to systematists to see if distributions of the other species will extend to other vents as more collections are made.

There appears to be no adaptation to hydrothermal vents (no adherent bacteria or

sulphur deposits) by either *Callipallene producta* (Sars) or *Colossendeis macerrima* Wilson. These species were collected or photographed in depths at which they have been previously taken on other expeditions. There is no reason to believe that their occurrence at or near hydrothermal vents is anything but coincidence. There are no records of either species having been taken previously in association with these vents.

The known species of *Sericosura* are difficult to separate taxonomically. Females are particularly difficult, lacking femoral cement glands and with leg setation sometimes greatly dimorphic from setation of males. This genus is also sometimes difficult to separate from *Ammothea* which usually has palps of nine segments, but some have six- or seven-segmented palps, and others have eight. The single consistent difference is the placement and shape of the male femoral cement gland. In *Sericosura,* it is proximolateral with a tube extending in a dorsal or dorsolateral direction. In *Ammothea,* the gland and its orifice are dorsodistal, usually with only a pore and not a tube. It is difficult to describe a new species of *Sericosura* from a female lacking full diagnostic characters. *Sericosura cyrtoma* is described as new because the single specimen has palps of seven segments, a number common to *Sericosura* (four out of six known species), but only two *Ammothea* species in 32 have seven-segmented palps (the number of segments in one varies from six or seven and in the other from seven to nine).

The specimens are deposited primarily in the Museum national d'Histoire naturelle, Paris (MNHN), with surplus specimens deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C. (NMNH).

Systematics

Family Ammotheidae Dohrn, 1881
Genus *Sericosura* Fry & Hedgpeth, 1969

Diagnosis.—Ammotheidae, very similar to *Ammothea.* Trunk fully segmented, with transverse ridges, but lacking discrete dorsal tubercles, lateral processes only slightly separated. Proboscis large, ovoid and straight, tapering or curved. Short ocular tubercle, blind, tip sometimes bifurcate. Chelifores two-segmented, scape short, adult chelae reduced to buds. Palps more commonly seven- or less commonly nine-segmented, distal segments short. Oviger ten-segmented, strigilis weak, with plain or denticulate spines, without terminal claw. Legs sexually dimorphic, propodus *Achelia*-like, claw long, with auxiliary claws, anterior/posterior propodi dimorphic in males of one species. Male cement gland bulge and orifice proximolateral, single tube at oblique or right angle to femur.

Key to the Species of *Sericosura*

1). Palps with seven segments 2
Palps with nine segments 5

2). Terminal palp segment longest of distal three; trunk and lateral processes with many slender spines and setae; proboscis ovoid, straight, carried horizontally 3
Fifth palp segment longer than either of distal two; trunk and lateral processes with short broad spines, few setae; proboscis downcurved. (Female only) . . . . . *S. cyrtoma,* new species

3). Male and female tibiae setae dimorphic, propodi similar 4
Tibiae similar in both sexes, male coxae has many more setae; female propodi alike, male propodi dimorphic, anterior four normal, other four inflated . . . . . *S. heteroscela,* new species

4). Female tibiae with long ventral setae mixed with short spines, male tibiae with few short ventral setae, no spines; male cement gland tube almost as long as femur diameter; palp second segment longest . . . . . *S. mitrata* (Gordon)
Female tibiae with row of very long lateral setae, male's with short setae; cement gland tube short, inconspicuous; palp fourth segment longest . . . . . *S. venticola* Child

5). Abdomen with long setae; ocular tubercle tip rounded; lateral processes with

long dorso- and laterodistal spines, female propodi with long lateral setae ..... *S. cochleifovea* Child

Abdomen with two tiny setae; ocular tubercle tip bifurcate; lateral processes with one laterodistal spine or none; propodi without long lateral setae ..... *S. bifurcata* Stock

(*Scipiolus thermophilus* Turpaeva, 1988, is a junior synonym of *Ammothea verenae* Child, 1987, from hydrothermal vents on the Explorer and Juan de Fuca Ridges in the NE Pacific.)

Sericosura heteroscela, new species
Figs. 2, 3

Material examined.—The types were from the Lucky Strike hydrothermal vent area, Mid-Atlantic Ridge, southwest of the Azores Islands. Cruise DIVA 1, sta. DV 19, Nuno site, sulphur tubes at the foot of hydrothermal vent, 37°17.5′N, 032°16.9′W, 1727 m, 23 May 1994, 1 ♂ with eggs, holotype, MNHN, Paris, 1 ♀, 1 juvenile, paratypes, MNHN, Paris. Same station, 1730 m, 27 May 1994, 2 ♂, 10 ♀, 3 juveniles, paratypes, MNHN, Paris, 1 ♂, 2 ♀, 1 juvenile, paratypes, NMNH, Washington.

Other material.—The following material came from the Lucky Strike hydrothermal vent area, 37°17.3′N, 032°16.5′W, 1629–1727 m, May–Jun 1994; at Tour Eiffel, Nuno, Isabel and Pagode sites, 9 ♂ with eggs, 7 ♂, 12 ♀, 6 juveniles, and Menez-Gwen Site, 37°50.5′N, 031°31.4′W, 850 m, May–Jul 1994, 2 juveniles.

Mid-Atlantic Ridge, Microsmoke Vent, 14°45′N, depth unknown, sta. PL 20, 22 May 1995, 1 ♀, 1 juvenile.

Description.—Size moderately large, leg span 26.7 mm. Trunk glabrous, dorsal segmentation lines raised, swollen, without dorsomedian tubercles. Lateral processes closely spaced, separated by 0.25–0.3 times their diameters, with ring of distal spines, dorsal ones largest, ventral spines smaller. Neck with broad anterolateral expansion, elevated dorsally in lateral view, with one or two short anterolateral spines. Ocular tubercle a small anterior-leaning tube, blind, with bifurcate tip. Proboscis very large, inflated, longer than trunk, without constrictions, with flat oral surface. Abdomen downcurved, extending to midpart of second coxae of fourth leg pair, armed with three or four pairs of short dorsal spines.

Chelifores short, scape one-segmented, only about twice longer than wide, armed with five or six spines, two dorsodistal ones longer than segment diameters. Chelae atrophied to knobs, fingers reduced to tiny bumps.

Palps seven-segmented, major segments armed dorsally with row of erect spines subequal in length to segment diameters. First segment broad, a truncate cone, second longest, slightly longer than fourth, distal three segments very short, of decreasing diameters, and armed with many short distal and ventral setae.

Ovigers fairly small, typical for genus. Second segment slightly longer than fourth or fifth, third curved at right angle, fourth and fifth subequal, with short lateral setae. Sixth, seventh and eighth with lateral setae longer than segment diameters. Seventh lacking denticulate spines. Eighth, ninth and tenth with tiny blunt denticulate spines in formula 2: 1: 2, spines with tiny laterodistal serrations. Eggs carried in cemented groups of moderate size, egg size slightly less than diameters of oviger segments.

Legs dimorphic, posterior four differing from anterior four, mainly in propodus. Second coxae less than 1.5 times length of first and third, all coxae similar. Femora similar in size and spination, cement gland a small raised bulge with small anterior pointing cone with apical pore at proximal end. All tibiae with dorsal, lateral and ventral setae mostly shorter than segment diameters, length of tibiae of anterior two pairs of legs subequal. Tibiae of posterior two pairs of legs unequal to anterior two pairs, inflated. First tibia of posterior two pairs longer and more inflated than second tibia. Tarsus of all legs subequal. Propodus of anterior two leg pairs typical, a curved cylinder without

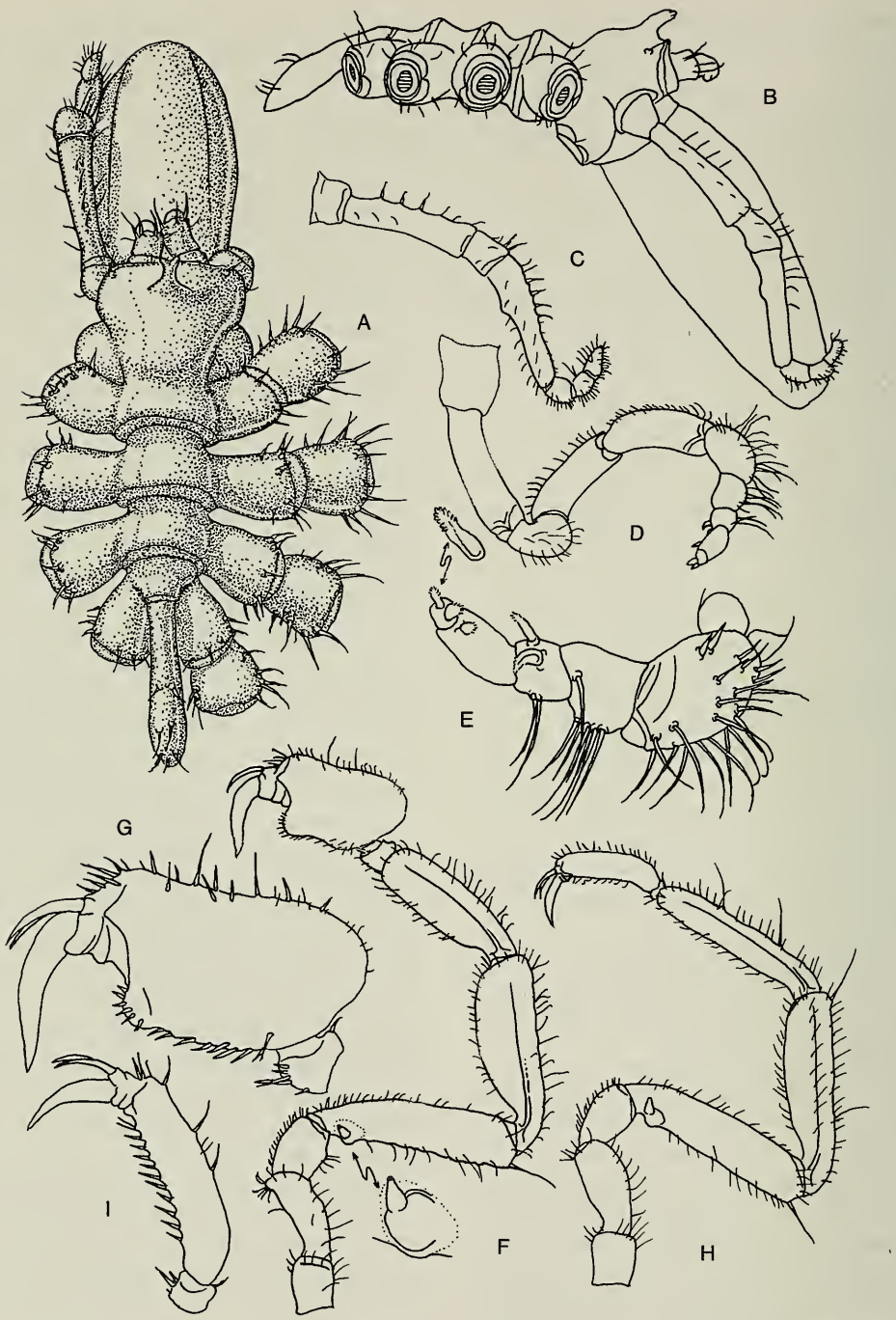

Fig. 2. *Sericosura heteroscela,* new species, holotype male: A, trunk, dorsal view; B, trunk, lateral view; C, palp; D, oviger; E, oviger distal segments and denticulate spine, enlarged; F, third leg; G, third leg distal segments, enlarged; H, second leg; I, second leg distal segments, enlarged.

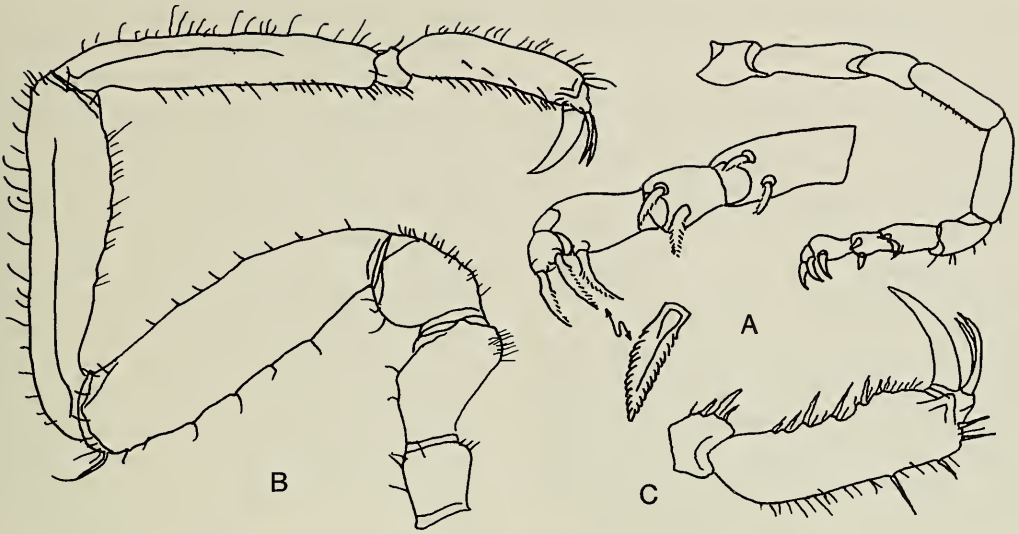

Fig. 3. *Sericosura heteroscela,* new species, paratype female: A, oviger with distal segments and denticulate spine, enlarged; B, third leg. Paratype juvenile: C, distal leg segments, enlarged.

heel, with row of short sole spines, few dorsal setae, a slender curved claw little more than half propodal length, auxiliaries little more than half main claw length. Propodi of posterior two pairs of legs grossly inflated, wider than any other leg segment, with few short sole spines, many short dorsal setae, and a distal sole bulge bearing row of six or seven short spines. Claw at tip of narrow anterior propodal extension, well curved, slightly recurved at tip, auxiliaries slightly longer than half main claw length.

Female and juvenile paratypes: Adult female with all legs alike, differing only slightly from anterior four legs of male. Second coxae slightly shorter in length, third coxae with dorsodistal swelling armed with many short setae. Femora of one female specimen are swollen more than those of other females and apparently recently contained eggs. First tibiae slightly longer than those of male. Distal leg segments like those of anterior legs of male. Female oviger much smaller, with more and larger denticulate spines having many more lateral lobes, in formula 2: 2: 1: 2. Seventh segment with two spines.

Juvenile males have incompletely formed posterior propodi which are only half as inflated, or less, as those of adult males. Inflation is more marked ventrodistally next to the claw insertion. At this stage, ovigers are not yet fully formed.

Measurements.—Holotype in mm: Trunk length from chelifore insertion to tip 4th lateral processes, 3.1; trunk width across 2nd lateral processes, 2.5; proboscis length, 3.6; abdomen length, 1.8; third leg, coxa 1, 0.58; coxa 2, 1.14; coxa 3, 0.80; femur, 2.4; tibia 1, 2.32; tibia 2, 1.82; tarsus, 0.37; propodus, 1.7; claw, 0.96; auxiliaries, 0.53.

Measurements of second leg distal segments: femur, 2.45; tibia 1, 2.4; tibia 2, 2.21; tarsus, 0.39; propodus, 1.25; claw, 0.56.

Distribution.—The Mid-Atlantic Ridge is the type locality for this new species, among sulfides and mussels at the base of hydrothermal structures at the Lucky Strike vent zone west of the Azores Plateau, in 1727–1730 m. Material came from other nearby Lucky Strike sites in 1685 m, and vents at Menez-Gwen area in 845–1685 m, and also from the 14°45′N site.

Etymology.—The specific name (Latin:

hetero = different, and *scela* = leg) refers to the dimorphic propodi in the male of this new species.

Remarks.—Differing leg morphology within the same specimen (intraspecific dimorphism) is fairly rare in pycnogonids. The most prevalent instance of this phenomenon is in the different propodal size and spination of some (but not all) species of the predominantly Antarctic genus *Ammothea.* The propodi of the anterior two pairs of legs in some species appear a little more inflated and have more sole spines than the propodi of the posterior two leg pairs in the same specimen. These inflation and spination differences are much less conspicuous than those of this species.

Inflation and differences in sole spination in *Ammothea* species are opposite to the situation in *Sericosura heteroscela.* In the latter species it is the posterior propodi which are grossly inflated and have different spination from the more slender or "normal" anterior propodi of male specimens.

The only other prevalent character which differs on some legs from others concerns sexual dimorphism. Besides the sex pores which appear on some male legs and not others in most pycnogonid genera, the major difference is that of the male cement gland and the shape of its exterior outlet. Among members of the family Austrodecidae, another mostly Antarctic group, the cement gland exterior cone or tube sometimes appears on the posterior four legs or in rarer instances, on the posterior two legs only and not on any anterior legs. There are some instances of a few species of genera in other families bearing cement glands only on posterior legs, but this is not at all common among any of the pycnogonid groups.

Besides the phenomenon of two different leg shapes in a single specimen, this difference also occurs between the sexes in the genus *Sericosura.* Legs of females, where known, are dimorphic to a greater or lesser degree from those of males in the same species. In the first known species, *S. mitrata,* legs of females have short spines and long setae confined mostly to the ventral surface of the tibiae. In males of the same species, the row of short ventral spines is lacking and any long setae are found only on lateral and dorsal surfaces of the tibiae. These differences are even more marked in *S. cochleifovea* where the male has rows of lateral and dorsal spines little longer than each segment diameter on the femora and tibiae. Females have lateral rows of very long setae on both tibiae and propodi while they are lacking on femora. This situation is reversed in *S. bifurcata* where males have long lateral tibial setae and females apparently have an even greater number of long lateral setae.

There is very little dimorphism of setae or other characters in legs of females of *S. heteroscela* when compared with only the anterior legs of males. The few differences appear mostly in the shorter and less setose female second coxae.

A character showing no sexual dimorphism is that of palp segment numbers. There are now six known species of this genus and two of them, *S. cochleifovea* and *S. bifurcata* have palps of nine segments. The other four, *S. mitrata, S. venticola, S. heteroscela,* and *S. cyrtoma* have palps with seven segments. Many genera, particularly among the Ammotheidae, have members with variable numbers of palp segments and this is therefore not a stable diagnostic character.

All known *Sericosura* species have chelifore scapes of a single segment. Several specimens listed above have what appears to be a wrinkle artifact proximally on the scapes which make them appear as though they have two segments. This is illustrated for the male holotype. Most specimens have scapes which are plainly 1-segmented.

Many of these specimens are lightly to heavily covered with white or brown filamentous bacteria or sulfides which do not appear to inhibit the free movement of their appendages.

Some specimens of this species were ob-

served in situ one meter from a black smoker of the Eiffel Tour site, Lucky Strike hydrothermal area (1630–1685 m), lying on sulfide blocks covered by a light film of hydrothermal sediments. Most of the other specimens came from washings of mytilid samples collected on the walls of active vent structures. These mytilid colonies live near fluid emissions with an average temperature of about 11°C (Van Dover et al. 1996). It should be noted that many of the specimens of *S. heteroscela* were more or less covered with filamentous bacteria. Similar bacterial filaments have been found commonly on pycnogonids collected in the Juan de Fuca and Explorer vent areas (Child 1987:892–901).

Shallow-water pycnogonids usually feed on sponge and hydroid tissues. Sponges such as *Cladorhiza* sp. and hydroids of the genus *Sympectoscyphus* sp. are abundant on active vent structures (among mytilid beds), atop extinct chimneys (Segonzac & Vervoort 1995:151), and could constitute an abundant food source for pycnogonids. These substrata are often covered at their extremities by white filamentous bacteria, probably the same as those observed on the pycnogonids themselves. These colonial organisms may constitute an abundant food source for vent pycnogonids.

Two juvenile specimens came from washings of mytilid samples at the Menez-Gwen area (850 m). These mussels live in dense groups of tens to hundreds of individuals on the slopes of a volcano formed of light grey hydrothermal sediments composed of silica. Translucent fluids are emitted in the vicinity of these colonies at a maximum temperature of 65°C (Y. Fouquet, pers. comm.). In this environment, sessile fauna (except for mytilids) is not visible, but sponges and hydroids can be found in the samples collected. In addition, basalts located less than ten meters away are colonized by gorgonians and scleractinians (*Lophelia pertusa*) which could serve as food for pycnogonids.

Sericosura cyrtoma, new species
Fig. 4

Material examined.—Hero 91 cruise, sta. PL 25, East Pacific Rise, Caldera site, 12°48′N, 103°54.6′W, 2563 m, 10 km S of 13°N, in hydrothermal vent area with vestimentiferans, 29 Oct 1991, 1 ♀, holotype, MNHN, Paris.

Description.—Size small, leg span about 17 mm. Trunk compact, lateral processes fairly short, closely spaced at less than half their diameters. Many short broad spines in raised sockets placed around dorsal rim of trunk anterior, dorsodistally on lateral processes and chelifore scapes, dorsally on abdomen and palp second segments. Cephalic segment anterior very broad, ocular tubercle broader than tall, on elevated mound, blind, with conspicuous lateral sensory papillae, and a laterally contracted posterior lobe. Proboscis large, carried ventrally at right angle to trunk, tapering distally from broad base, with distal downcurve at sharp angle. Oral surface small, tip rounded. Abdomen moderately long, carried at ventral oblique angle, armed with four broad dorsolateral spines and several short distal setae.

Chelifores very short, scape slightly less than twice longer than its diameter, armed with row of dorsodistal short spines in sockets. Chelae tiny, globular, fingers reduced to tiny ventral bumps. Palps of seven segments. Second segment with two short dorsal spines and single distal seta. Fourth segment longest, segmentation line between third and fourth segments indistinct, both armed with several dorsal spines and setae longer than segment diameters. Distal three segments short, fifth as long as sixth and seventh combined, sixth shortest, seventh slightly longer and more slender, all three armed with few setae, ventral setae longest.

Oviger second segment almost twice longer than first or third, fourth and fifth longest, subequal, less than four times longer than wide. Sixth short, curved, with two lateral setae. Strigilis with plain spines in for-

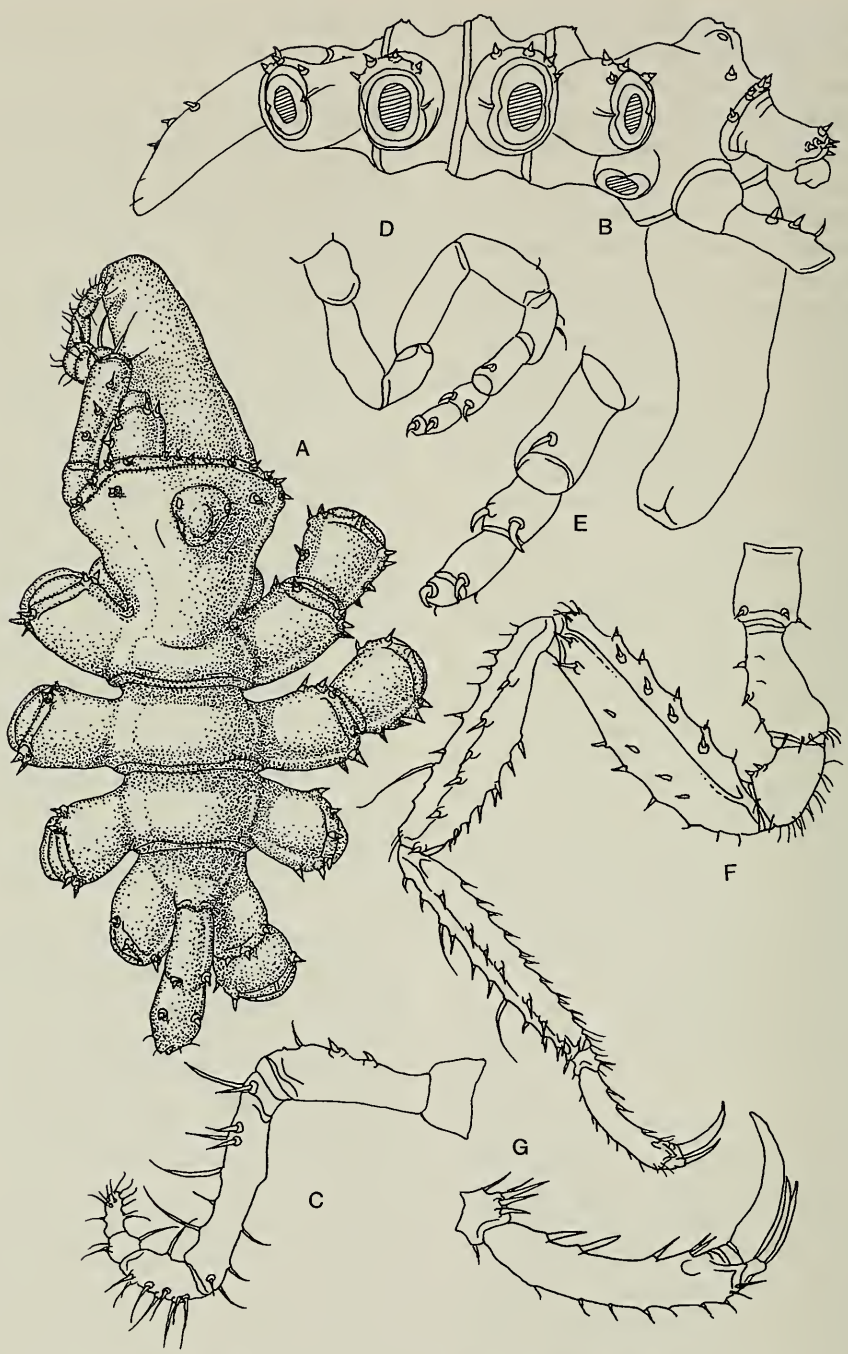

Fig. 4. *Sericosura cyrtoma,* new species, holotype female: A, trunk, dorsal view; B, trunk, lateral view; C, palp; D, oviger; E, oviger distal segments, enlarged; F, third leg; G, third leg distal segments, enlarged.

mula 1:2:1:1, with the terminal segment a tiny bulb.

Legs with many short dorsal, lateral, and ventral spines on sockets in rows. Second and third coxae with field of ventral and ventrodistal setae. Major segments of almost equal length, femora only slightly longer. Second tibiae with row of many short ventral setae. Tarsus very short, with several ventral spines. Propodus long, slender, with two proximal sole spines, and another more distal, a pair of distal setae and several shorter dorsal spines. Claw long, well curved, auxiliaries long, about 0.6 main claw length.

Male characters unknown.

Measurements.—Holotype in mm: trunk length from chelifore insertion to tip 4th lateral processes, 1.91; trunk width across 2nd lateral processes, 1.36; proboscis length, 1.45; abdomen length, 0.92; third leg, coxa 1, 0.43; coxa 2, 0.74; coxa 3, 0.59; femur, 1.65; tibia 1, 1.56; tibia 2, 1.58; tarsus, 0.16; propodus, 0.77; claw, 0.39.

Etymology.—The specific name (Greek: kyrtoma, a curve or hump) refers to the hump-like curve of the proboscis.

Remarks.—There is no other known species in this genus which has such a spiny, cactus-like appearance and a downcurved proboscis. Almost all of the dorsal spines of this specimen are extremely short and broad while the lateral and ventral spines are of a more usual or longer length. There are relatively few setae on this unique specimen except for a ventral field on the second and third coxae and a few on the palp and distal abdomen. Male legs will undoubtedly have different arrangement of spines and setae, consistent with the usual dimorphic leg characters in this genus.

The single specimen of *S. cyrtoma* was found in an active hydrothermal area of the Caldera site, East Pacific Rise, 10 km south of the 13°N hydrothermal area. No pycnogonid has been collected before in this area, despite intensive sampling since 1982. The Caldera site, still undescribed, is not very different from other 13°N sites: with vestimentiferans, living in areas of diffuse venting at temperatures of 6°–7° to 12°C, between inactive chimneys 15 m high atop a sulfur mound 67 m high. Associated fauna is composed of limpets and barnacles on *Riftia* tubes, serpulid polychaetes, galatheid and brachyuran crabs, anemones, fish and shrimp.

Sericosura venticola? Child, 1987

Sericosura venticola Child, 1987:896–899, fig. 2.—Stock, 1991:158–159 [text].

Material examined.—*Naudur* cruise, sta. ND 18–4–8B, Rehu Site, North of Easter Island, SE Pacific Rise, among vestimentiferans, 17°24.8′S, 113°12.1′W, 2578 m, 23 Dec 1993, 1 juvenile.

Distribution.—If this single juvenile specimen is indeed *S. venticola,* then its distribution is greatly extended to the southern hemisphere and to a totally different hydrothermal vent area. The type specimens were taken in the NE Pacific on the Endeavour Segment of the Explorer Ridge, in about 2200 m. If this specimen is *S. venticola,* it would mark the first time a species in this genus has been reported from more than one hydrothermal vent field, separated by several thousand kilometers.

Remarks.—Several characters of this juvenile specimen agree almost exactly with those of *S. venticola,* while several do not. Possibly these differing characters can be attributed to the juvenile state of this specimen or to the lack of a described female for this species. It is extremely difficult to identify a juvenile in this genus of seemingly morphologically uniform species and we assign this specimen to a species with great hesitation.

The chelate specimen appears to be a female, although the oviger is only half formed and there are no sex pores. It has very long setae on major leg segments in keeping with the more or less dimorphic state between sexes in this genus. Male leg setae of *S. venticola* are shorter and placed differently than those of this specimen. The

long setae are similar to those on legs of male specimens of *S. bifurcata* Stock, but other characters are very different from that species.

The seven-segmented palps of this juvenile are almost exactly like the palps of *S. venticola,* including two long dorsal setae of the fourth segment. The chelae are rather broad, as are those of *S. venticola,* and the ocular tubercle is the same shape and height, although the laterodistal bumps of the adult ocular tubercle are extended as lateral tubercles twice as long as their diameters in this juvenile. The long downcurved abdomen is virtually alike in both this specimen and the types and juvenile lateral processes are separated by only short intervals and are about the same length as those of the types. The length ratio of proboscis and trunk of this juvenile corresponds to that of the types, with the proboscis carried in the same horizontal aspect. There appear to be sufficient characters in agreement between the types and this juvenile to suggest that they are conspecific. Adults from the same locality are needed to confirm this suggestion.

This juvenile specimen of *S. venticola*? was found in washings of vestimentiferan (probably *Riftia pachyptila* and *Tevnia jerichonana*) samples collected on an active hydrothermal site on the East Pacific Rise north of Easter Island (Geistdoerfer et al. 1994).

Family Callipallenidae Hilton, 1942
Genus *Callipallene* Flynn, 1929
Callipallene producta (Sars, 1888)

Pallene producta Sars, 1888:342; 1891:36–37, pl. III, fig. 2a–d.
Callipallene brevirostris producta.—Stock, 1952:6–7, figs. 9–11 [early literature].
Callipallene producta.—Stock, 1990:227 [recent literature]; 1992:128.—Bamber & Thurston, 1993:849.

Material examined.—*Diva* 1 cruise, sta. DV 13-6, Menez-Gwen site, Mid-Atlantic Ridge, 37°50′N, 031°32′W, 844 m, 21 May 1994, 1 ♂.

Distribution.—This well-known species has been collected from Norway to the Azores, Spain, and the Canary Islands, and in the Mediterranean and Black Sea at several localities. It has a wide depth range of 130–1550 m. This male is well within its known geographic and depth ranges.

Remarks.—This is the first time this species has been found associated with or in the vicinity of known hydrothermal vents. It is probable that many other known species from deeper water eventually will be collected at or near known hydrothermal vents.

Family Colossendeidae Hoek, 1881
Genus *Colossendeis* Jarzynsky, 1870
Colossendeis macerrima Wilson, 1881
Fig. 5

Colossendeis macerrima Wilson, 1881: 246–247, pl. 1, fig. 2, pl. 4, figs. 9–12, pl. 5, fig. 32.—Fry & Hedgpeth, 1969:53 [literature], figs. 7, 8.—Child, 1995:83–84.

Material examined.—*Diva 2* cruise, Lucky Strike vent area, from inactive chimney next to Isabel site, 37°17.4′N, 032°16.6′W, 1688 m, 1 spec. The specimen was photographed but not collected.

Distribution.—This is a cosmopolitan deep-sea species.

Remarks.—The size and proboscis of the specimen in Fig. 5 leaves almost no doubt that it is this species. For scale, the metal cup in the picture is 18 cm wide. This specimen was filmed for several minutes, moving slowly at the top of an inactive structure. Fauna found elsewhere was almost absent here, except for a white gorgonian.

Acknowledgments

We wish to thank the chief scientists: Y. Fouquet (*Diva 1* cruise), A.-M. Alayse and D. Desbruyères (*Hero 91 & Diva 2* cruises), J.-M. Auzende (*Nadur* cruise), and the

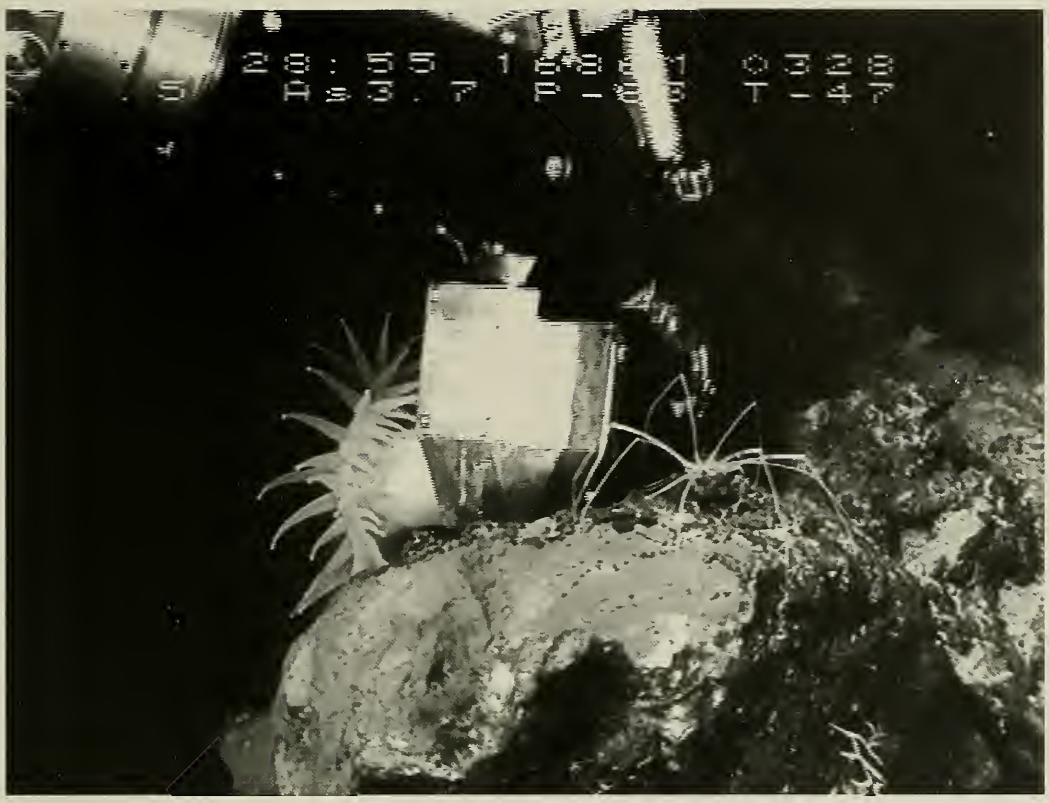

Fig. 5. *Colossendeis macerrima* Wilson. Live specimen in situ. (Width of metal cup = 18 cm.)

crews of both the N/O *Nadir* and the submersible *Nautile,* who participated in the cruises. We thank W. Vervoort (Hydroids) and H. Zibrowius (Scleractinia) for their identifications, P. Briand for his technical aid (specimen sorting and color plate), Mrs. J. Jennings for help with translations, and P. Chevaldonné and T. Comtet for reviewing the manuscript.

The material studied herein originates from French cruises (*Diva 1* and *Diva 2*) organized by IFREMER institution within the framework of the FARA program (French American Ridge Atlantic).

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